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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/627,571	07/28/2000	Haixiang Liang	1005-0018	2336
22120	7590	04/01/2005	EXAMINER	
ZAGORIN O'BRIEN GRAHAM LLP 7600B N. CAPITAL OF TEXAS HWY. SUITE 350 AUSTIN, TX 78731			CHANG, EDITH M	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 04/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/627,571	LIANG, HAIXIANG	
	Examiner	Art Unit	
	Edith M Chang	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>20050121</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 21, 2005 has been entered.

Response to Arguments

2. Applicant's arguments, see pages 11, filed on January 21, 2005, with respect to the rejection(s) of claim(s) 1-4, 7, 9-10, 13-17, 19 and 27 under USC 102 and claims 5-6, 8, 11-12, and 18 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Scull et al. (US 6,108,354).

Claim Objections

3. Claims 1-12, 20-14 and 29-30 objected to because of the following informalities:

Claim 1, line 3: "aggregate impairment" is suggested changing to "an aggregate impairment"; line 8: "phase intervals" is suggested changing to "the phase intervals".

Claim 2, line 5: "symbol estimates" is suggested changing to "the symbol estimates".

Claim 20, line 8: "N phase" is suggested changing to "N phases intervals".

Claims 3-12, 21-24 and 29-30 are dependent on objected claims 1 and 20.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-12, 14-16 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 5: “such group” does not clearly indicate what or which such group is.

There are groups recited in line 3; line 9: “other constellation indices” lacks antecedent basis.

Claim 2, line 4: “such constellation index” does not clearly indicate what or which such constellation is; line 10: “respective constellations” lacks antecedent basis.

Claim 14, line 5: “the constellation index” lacks antecedent basis; line 10: “respective constellations” lacks antecedent basis.

Claim 15, lines 1-2: “, as recited in claim 13, wherein the constellation point selecting for a particular constellation” does not recited in the claim 13. In claim 13, lines 9-10 recites the step of selecting constellation points for each of the J constellation indices; and lines 6-7: “the next lowest power constellation points” lacks antecedent basis.

Claim 16, lines 1-2: “, as recited in claim 13, wherein the constellation point selecting for a particular constellation” does not recited in the claim 13. In claim 13, lines 9-10 recites the step of selecting constellation points for each of the J constellation indices; and lines 7-8: “the next lowest power constellation points” lacks antecedent basis.

Claims 3-12 and 30 are dependent on the rejected claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okunev et al. (US 6272171 B1) in view of Scull et al. (US 6,108,354).

Regarding **claims 1-4, 13-17, 19-21 and 25-26**, in FIG.1a-1 & 1a-2, Okunev et al. discloses a robbed bit signaling (RBS) identification PCM modem and its method (column 1 lines 14-17) comprising:

grouping slots of the digital impairment learning (DIL) sequence (FIG.1a-1 step 15, column 8 lines 6-8, where the DIL signal separated slot by slot into tables, typical six slots handled by step 15, symbols in the slots as phase intervals) based on having robbed bit or not (steps 25 & 30, column 8 lines 18-20, as similarity of aggregated impairment) and *calculating* tables of distances (step 20, as a characteristic set of symbol estimates); in column 2 line 60-column 3 line 10, wherein the N phase intervals are the N symbols in the slots, aggregated impairment is such as RBS, signal levels in tables are the symbol estimates;

and in FIG.1b, *assigning* constellation points for the six slots of a frame (column 9 lines 29-31 & lines 43-46). The six slots separated by step 15 is as constellation indices J that 6 slots of step 15 performed one time/iteration (column 8 lines 6-8 where typical six slots handled by

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step 15) based on one or more characteristic sets (column 3 lines 35-40 such as distance, column 5 lines 53-65 such as power);

in FIG.8a & FIG.8b and column 18 line 35-column 19 line 25, Okunev teaches *performing the assigning* points for each distinct constellation, *selecting* successive candidate next constellation points (column 18 lines 38-41, where selecting successive candidate next points) that, based on symbol estimates, satisfy a distance metric, *assigning one* of lowest power ones (column 18 line 41-46, satisfy the minimum distance and assigning lowest power ones), and *adding* a highest power one (column 18 lines 50-61).

However, Okunev et al. does not explicitly specify the structure/definition of the slots of a frame. Scull et al. teaches the DIL frame with basic RBS slots/period and the RBS time intervals as (slots) in FIG.1 (column 2 lines 5-7, a frame structure) and column 1 lines 44-56 wherein the time interval "1" (index of a time interval) includes phase/symbol/octet O_1, O_7, O_{13}, \dots etc., and interval "2" includes $O_2, O_8, O_{14} \dots$ etc.; and in FIG.3, step 26, indexing the signal levels by the time interval "1", "2", ... etc..

As Okunev et al. using the DIL to identify robbed bit signals stated in the Abstract and column 2 lines 22-34, and Scull et al. teaching the system, device and method for detecting and characterizing impairment (column 1 lines 6-11), at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the frame structure and time intervals as slots taught by Scull et al. in Okunev et al.'s method step 15 separating the DIL into time interval (or slots, here the slots are time intervals defined by Scull et al.) to determine RBS (column 1 lines 44-45 '354) to provide PCM information for the purpose of improving the modem performance (column 1 line 65-column 2 line 2).

The modified Okunev et al.'s system and method with Scull et al.'s teaching teaches one or more other time intervals (indices) of the frame contributing the symbol estimation as shown in steps 120 & 130 of FIG.1b ('171), wherein the characteristic sets *including contributions* of levels (symbol estimation) of other six time intervals (slots/indices) in the frame; and

a receive path (FIG.2 17 analog loop '354); and an impairment compensator (FIG.2 18 PCM Modem '354) as recited in the claims.

Regarding **claims 5 & 6**, the modified Okunev et al.'s method with Scull et al.'s teaching teaches the k^{th} , $(k+6)^{\text{th}}$, $(k+12)^{\text{th}}$, and $(k+18)^{\text{th}}$ one of the phase interval (as octets, column 1 lines 47-53) each index with multiple octets and the time interval numbers are 1-6 in FIG.6 '354).

Regarding **claim 7**, Okunev et al. discloses a single phase interval corresponds to each constellation index (column 18 lines 34-36).

Regarding **claims 8, 18 & 24**, the modified Okunev et al.'s system and method with Scull et al.'s teaching teaches 24 octets/symbols (phases intervals) in one frame (FIG.1 '354) and six time intervals/indices in FIG.6 ('354).

Regarding **claim 9**, the modified Okunev et al.'s system and method with Scull et al.'s teaching grouping a received DIL (the impairment compensation sequence) that places at least one instance of each symbol from a predetermined set of symbols (FIG.4, column 2 lines 13-15 '354).

Regarding **claim 10**, Okunev et al. discloses communicating the constellation points to a remote communications device (column 2 lines 10-20).

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Regarding **claims 11 & 12**, Okunev et al. discloses the symbol estimates including amplitude estimates (column 2 lines 31-37), and in column 1 lines 60-62 & column 2 lines 6-21, wherein a set of Ucodes is comprised in the constellation as the standard.

Regarding **claim 22**, the modified Okunev et al.'s system and method with Scull et al.'s teaching teaches a transmit path (FIG.1 unites 14-17 '354), the PCM Modem (as the compensator) coupled to the transmit path.

Regarding **claim 23**, the modified Okunev et al.'s system and method with Scull et al.'s teaching teaches more than one RBS affected interval in the basic period of six (column 1 lines 53-55 '354) and J (J is six) number indices (FIG.6 '354).

Regarding **claims 27 & 28**, Okunev et al. discloses a computer program product (column 22 lines 60-65, all flow charts are for the instructions) of the modem comprising the subject matter claimed (refer to rationale of claim 13).

8. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okunev et al. (US 6272171 B1) in view of Scull et al. (US 6,108,354) as applied to claims 20 and 9 above, and further in view of Ohta (US 5,265,125).

Regarding **claims 29 & 30**, the modified Okunev et al.'s system with Scull et al.'s teaching does not explicitly specify or detail the PCM Modem structure. However, in FIG.1, Ohta teaches the PCM signal detection apparatus with the partial response equalizer (23 FIG.1). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement the PCM signal detection apparatus with the partial response equalizer taught by Ohta

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in the PCM modem to control the ISI (column 1 lines 15-20) for the purpose of reducing the equalization errors (column 2 lines 7-10) and detecting accurate signal (column 1 lines 61-65).

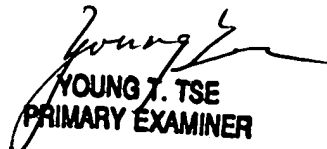
For the communication device using constellations and its constellation method of the invention, the class of the partial response equalizing does not show uniqueness and is not indispensable for the communication device using constellations and its constellation method of the invention.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
March 24, 2005


YOUNG T. TSE
PRIMARY EXAMINER